



Network Evolution – PSTN in Transition

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Activities

Activities

**Detailed
Requirements &
Recommendations
for Focus Group
Report (Feb. 2013)***

**Targeted Analysis
&
Recommendations
to FCC's TAC
(6/27/12, 9/24/12
and 12/10/12)**

**Webinar (3/7/13)—
over 200
attendees****

*www.atis.org/docstore

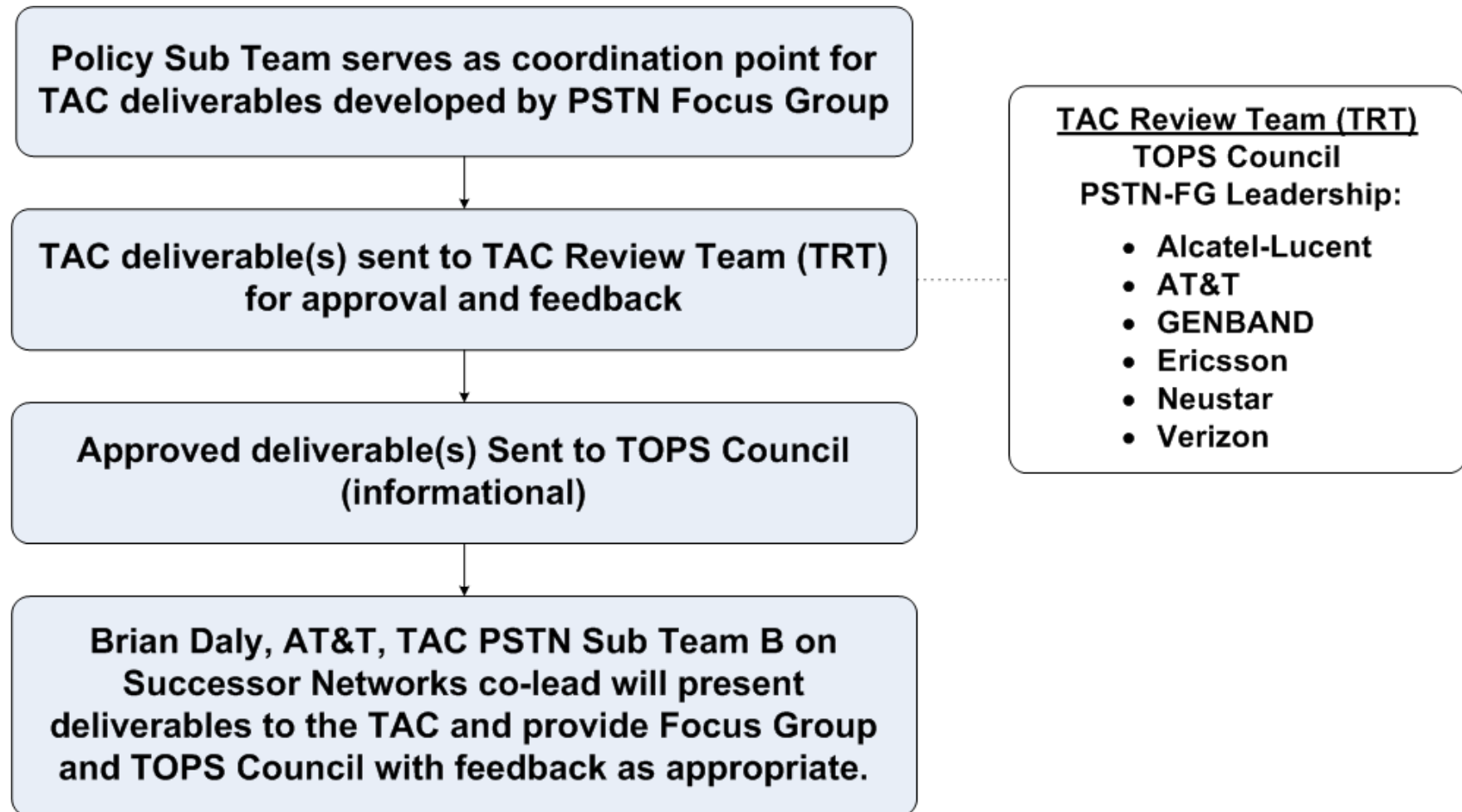
**<http://www.atis.org/events/index.asp>



FCC TAC PSTN Transition

- In 2011 and 2012, the FCC TACs have made a number of recommendations for effecting the transition from the PSTN.
- Total of seven Study Areas:
 - Copper Retirement (Re-Use)
 - PSTN User Impacts
 - Interconnection
 - Database Transition
 - Numbering (User/Service/App Identifiers)
 - Quality of Service
 - Robustness and Public Safety
- Consolidated recommendations to the FCC in three areas:
 - Databases and Identifiers
 - QoS and Interconnection
 - Robustness and Public Safety
- Focus for 2013+ should be planning for transition

TAC Communication Process



PSTN Transition Subteams

Application Services

*Chaired by
GENBAND*

- PSTN Services in Transition
- New Services
- Successor Networks
- Protocol Issues
- Evolving Applications environment

Access

*Chaired by
Ericsson*

- End user access issues
- Alternative accesses
- Customer Expectations
- CPE Stranding
- User-related Regulations

Transport

*Chaired by
Alcatel Lucent*

- End-to-end Communication
- Interconnect Models
- Routing
- Authentication
- QoS, Security
- Emerging Technologies

Policy/ Numbering

*Chaired by
Neustar*

- Addressing
- Administration
- Numbering Authentication
- ENUM capabilities
- Databases

ATIS Focus Group Participants

- Adtran
- Alcatel-Lucent
- AT&T (co-lead)
- Bell Canada
- CenturyLink
- Cisco
- Ericsson
- GENBAND
- Huawei
- JDSU
- Juniper
- Neustar
- Qualcomm
- Time Warner Cable
- Verizon (co-lead)



PSTN Transition Report

- PSTN Transition Assessment and Recommendation report has been completed.
- Evaluated the network's current state and defines opportunities for new and richer communication capabilities that the successor network will deliver.
- Assessed key issues in the transition across four areas of network evolution: application services, access, numbering, and transport.
- Represents the only comprehensive industry resource outlining the key considerations for decision makers on all aspects of network evolution.

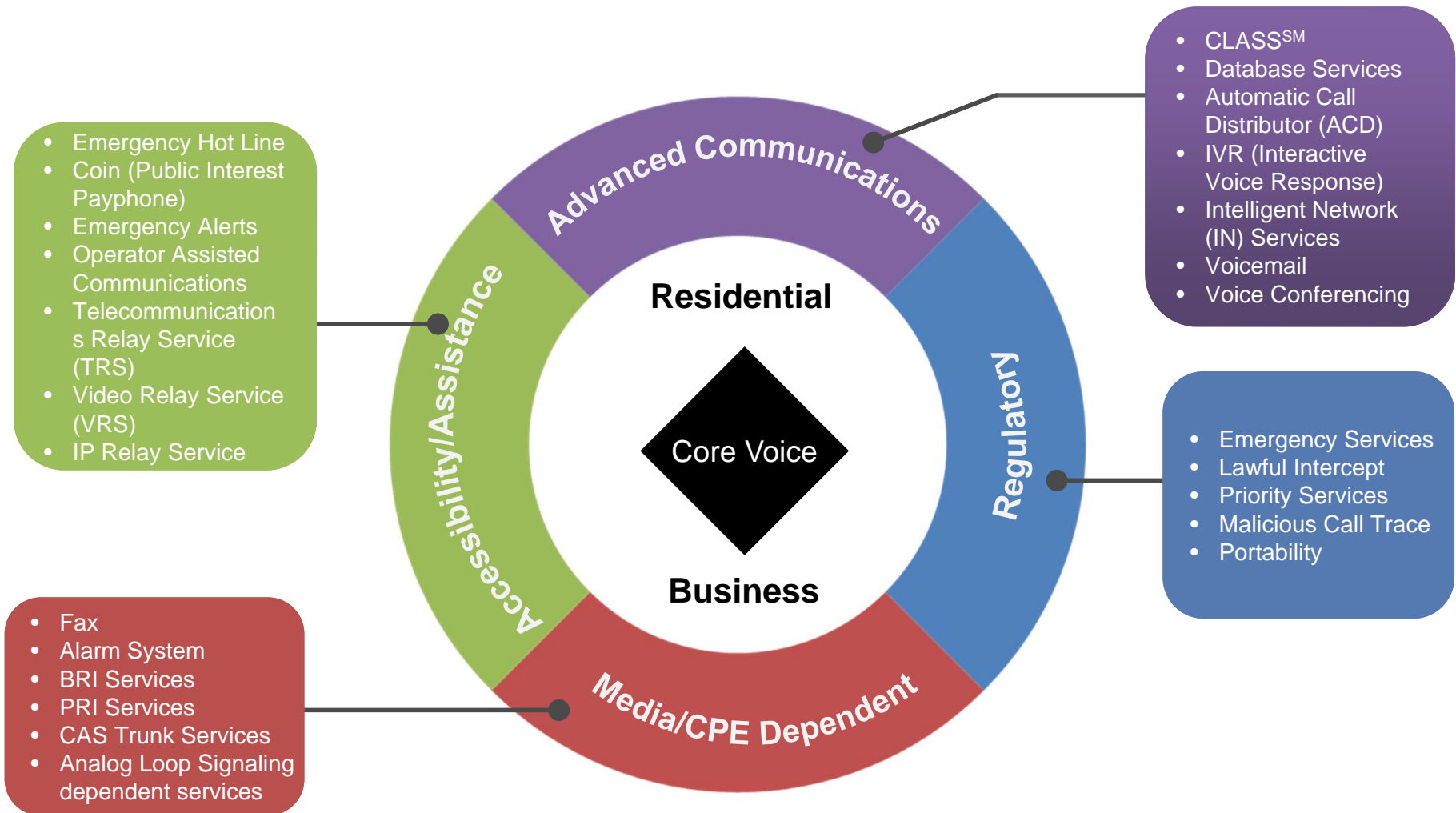




PSTN Transition Application Services Sub-team



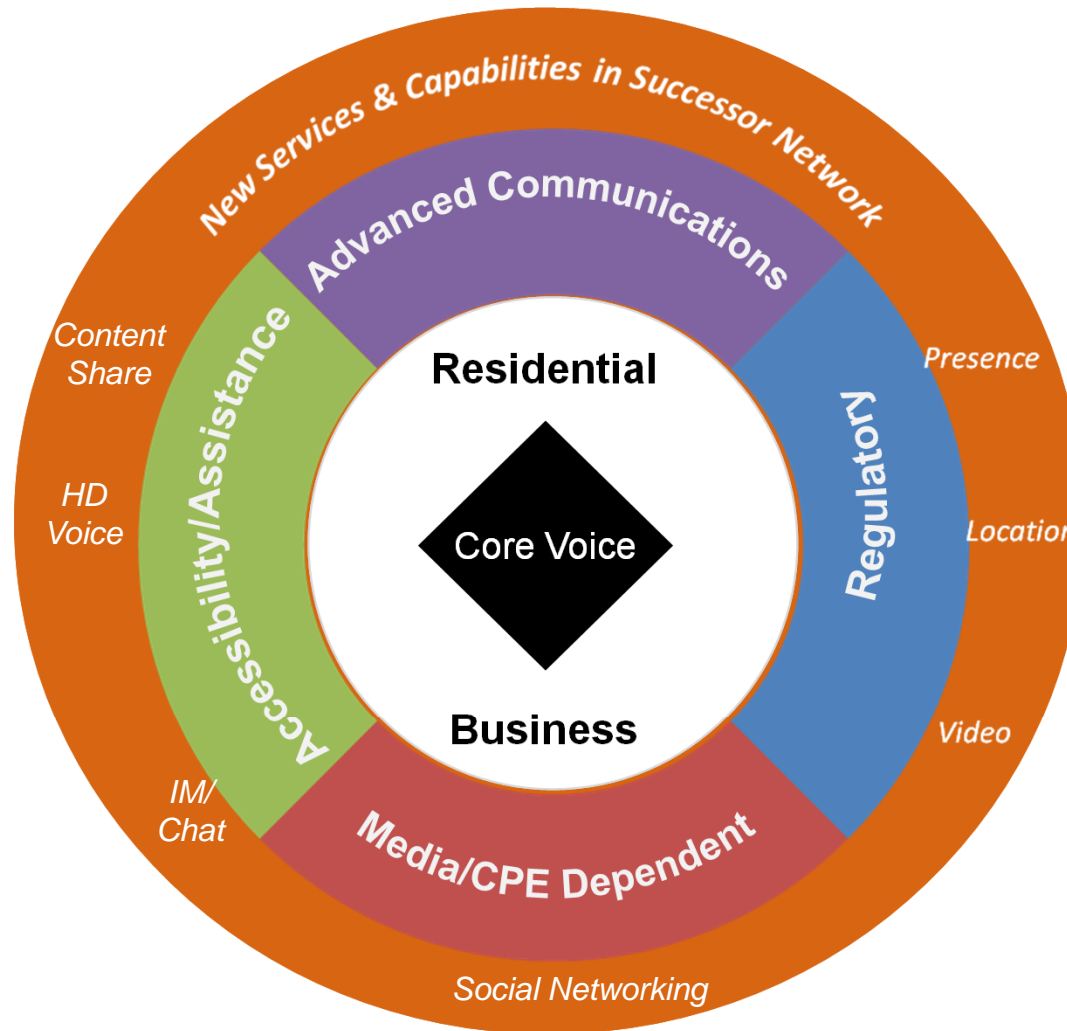
PSTN Applications Services in Transition



Applications Services in Successor Networks

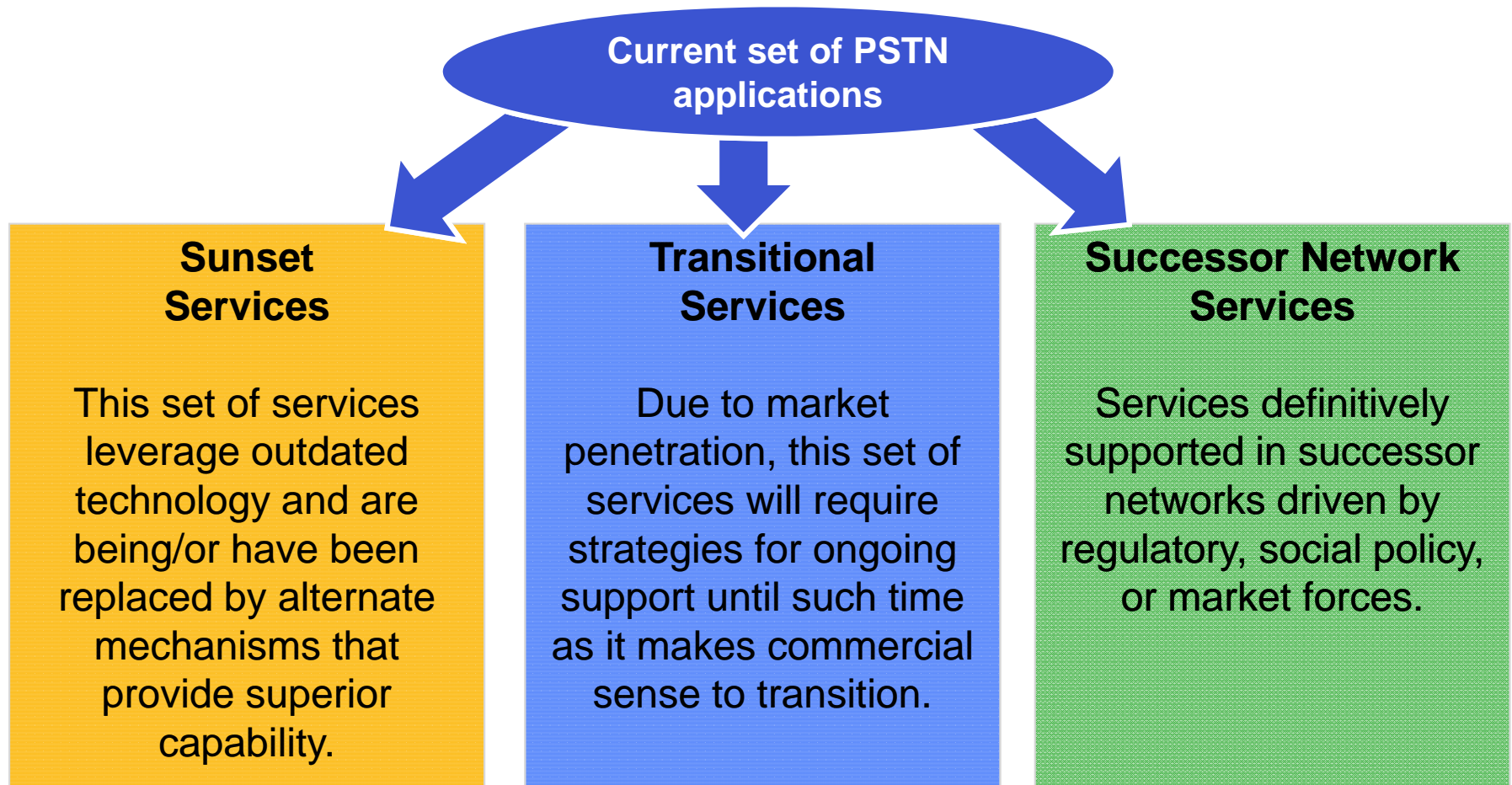
Consumers will have access to range of new application services

Key principles still apply –
Market forces,
standardization,
self-regulation,
and government oversight continue to influence definition



New applications defined today will evolve over time as more broadband services become available and achieve market penetration

Application Services Categories



Summary

- Significant number of current applications will be supported in both Transitional and Successor Networks, although they may be implemented or delivered in alternate forms.
- Solutions exist to support most legacy PSTN functions in next generation networks (currently in transitional phase), though desirable functions of CLASS Services need to be mapped to IP-based network.
- Relatively equal distribution of Services evolving to Successor Networks driven by regulatory considerations (e.g. emergency calling) vs. market demand.
- Recommendations for further study:
 - Calling number and name delivery privacy regulation
 - Portability

For most applications, business drivers will determine which applications migrate and how they do so



PSTN Transition Access Sub-team



Access – Key Considerations

PSTN Assessment

Voice grade
channels

Fixed lines
(no mobility)

Access ► Voice
Service Provider

Carrier-provided
line power

Subscriber side
signaling

Availability



Key Issues

Stranding of CPE
(Analog phones, fax,
alarm, PBXs, etc.)

**Loss of central
office power**

Robustness

Access Summary

- Stranded CPE should be treated as an economic issue (not a policy issue), and in most cases consumers are voluntarily making the transition to better solutions.
- Removal of C.O. provided line powering is also an economic issue – emergency powering can be provided as a feature.
- Reliability and robustness in the future network are less dependent on underlying access network and can be engineered to various levels.





PSTN Transition Transport Sub-team



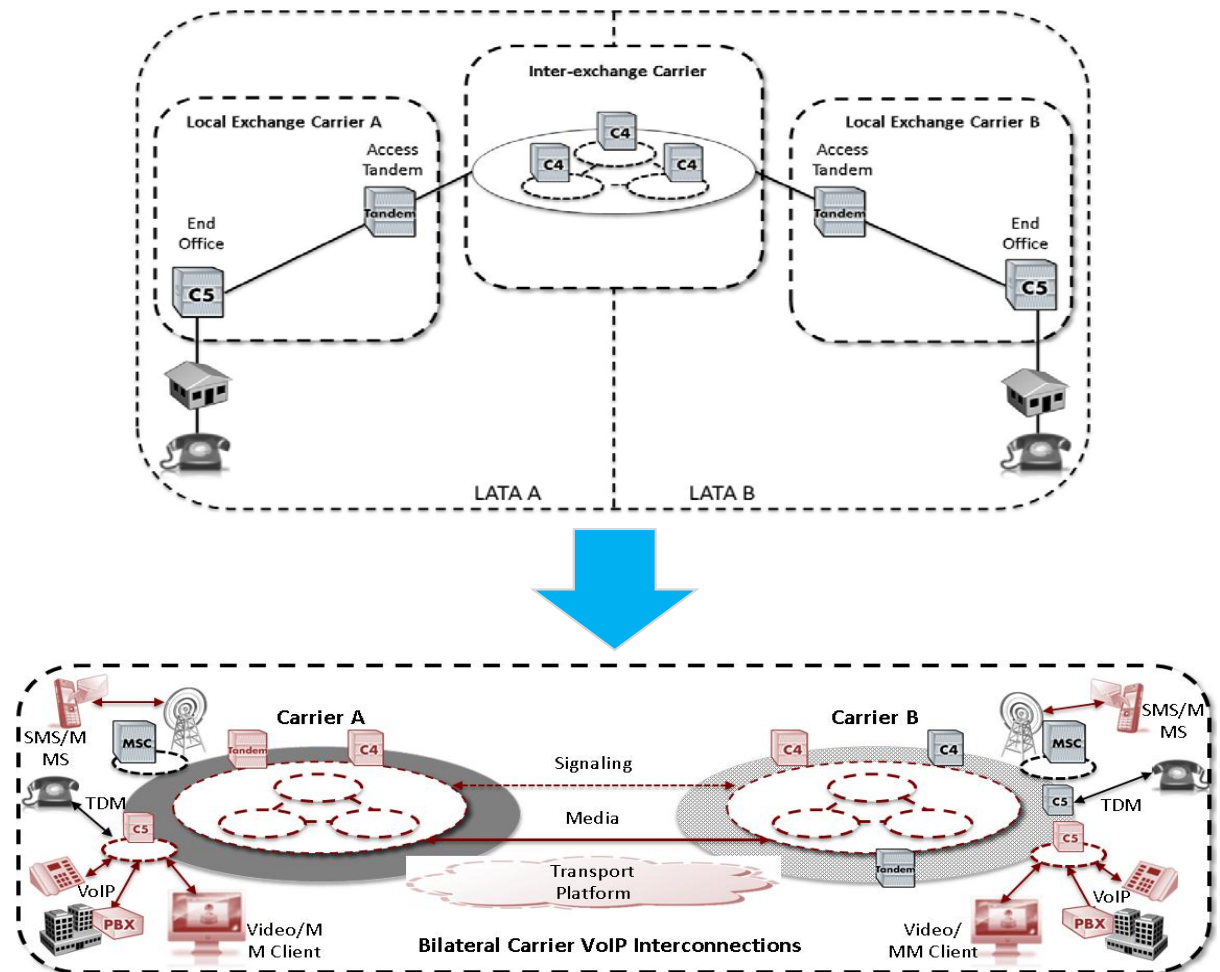
Key Issues

- Addressing and routing
 - Direct interconnect requires access to address resolution
- Security
 - E.g., Identity verification to control SPAM calling
- QoS
 - Proliferation of networks using unmanaged transport
 - Access QoS most important
- Bundling of signaling with media
 - Most models assume availability of signaling along with media through managed transit networks to facilitate per-call charging for media transport – facilitated through media anchoring
- Charging
 - Transition from sending-party-pays to bill-and-keep

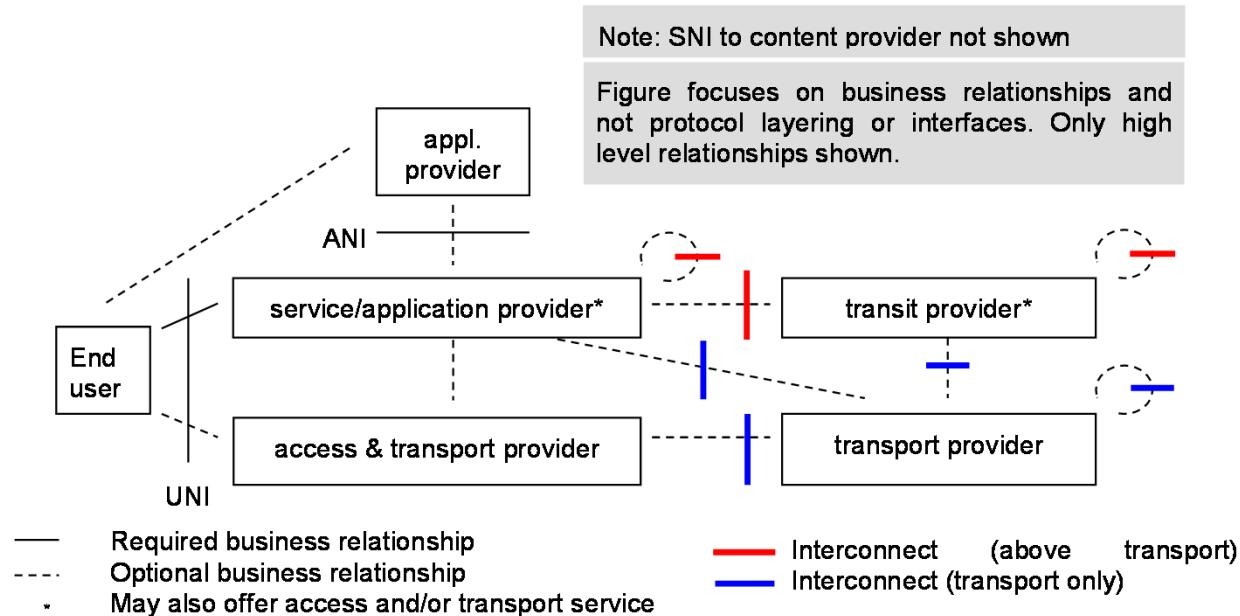


Transition to IP Interconnect

- As the interconnect architecture moves to IP, it becomes flatter, more direct, less tied to geography, in need of more security.
- Many technical options exist due to evolving standards and industry practices.
- Negotiated commercial agreements needed to resolve myriad technical and operational issues.
- Multiple “successor networks” will provide a wide range of services.



Simplified Business Model



- Models evolving to allow separation of service and access providers
- Business agreements evolving to separate provision of and charging for transit service and media transport

Observations/Trends

- IP interconnect would significantly advance with the availability of an industry-wide address translation and routing solution (e.g., ENUM)
- There is an increasing need for authentication of users and/or service providers to minimize fraud and spam
- The industry is moving from an established interconnection model to multiple models
 - The models have varying requirements (QoS, security, etc.) and compensation arrangements
 - Model diversity breeds innovation but eventually a few dominant models must prevail
- These unique QoS and security requirements will introduce new challenges and opportunities for managed communication services
- The PSTN transition is best served by allowing a gradual evolution of services and interconnection models
- The separation of service provider responsibility for communication services and IP access is a key driver for new interconnection models
- Emerging technologies and services (e.g., OTT, cloud, WebRTC, OMR) will significantly influence the evolution of interconnection models



Recommendations

- The industry should agree on a tiered routing architecture based on the carrier registering the user's TN
 - LATA routing is unnecessary
- Future interconnect models should support identity authentication of the users and access and service providers
 - To provide security, compensation support, and fraud/spam control



PSTN Transition Policy/Numbering Sub-team



Numbering: Findings

- *Addressing:*
 - Resolve issues related to TN-internet addressing, to enable IP-IP routing (Information exchange, discovery, mutual authentication)
 - Consider a TDM-to-IP addressing solution that conserves numbering resources
- *Telephone Number Administration:*
 - Evaluate implications of expanded geographic area codes.
 - Assess implications of breaking the linkage between geography of the TN and geography of the point of interconnection.
 - Eliminate number allocation and assignment based on rate centers and LATAs.
 - Assess the implications of direct consumer registration of TNs.
- *Numbering Authentication:*
 - Ensure that TNs on IP networks are secured against spoofing.





Recommendations for ATIS



Recommendations for ATIS

ATIS should perform the following actions (with the ATIS Packet Technologies and Systems Committee (PTSC) taking the lead and coordination function):

- Analyze the IP interconnection recommendations and determine the need for new specifications.
- Analyze the impact of emerging technologies and services (e.g., OTT, cloud, WebRTC, OMR) on future interconnection.
- Examine the impact on commercial issues, including the potential enhancements for multiservice support.
- Encourage the voluntary convergence of the industry on a minimal set of the most broadly-adopted models of interconnection.